CHAINSAW BAR TENSIONING APPARATUS

Related Applications

[0001] This application claims the benefit under 35 U.S.C. § 119(e) of U.S. Provisional Patent Application No. 60/426,710, filed November 15, 2002, titled "Chain Saw Bar Tensioning Assembly," which is incorporated herein by reference.

Brief Description of the Drawings

[0002] In order that the manner in which the above-recited and other advantages and objects of the invention are obtained, a more particular description of the invention briefly described above will be rendered by reference to specific embodiments thereof which are illustrated in the appended drawings. Understanding that these drawings depict only typical embodiments of the invention and are not therefore to be considered to be limiting of its scope, the invention will be described and explained with additional specificity and detail through the use of the accompanying drawings in which:

[0003] FIG. 1 is a side elevation view of a chain saw bar constructed according to one embodiment of the invention.

[0004] FIG. 2 is a side elevation view of the embodiment depicted in FIG. 1 wherein the sliding member is locked into position.

[0005] FIG. 3 is a side elevation view of a chain saw bar constructed according to a second embodiment of the invention.

Detailed Description of Preferred Embodiments

[0006] A first embodiment of the tensioning assembly invention is depicted in FIGS. 1-2. As shown in FIG. 1, a chain saw bar 100 is shown comprising a sliding member 110, a first tensioning member 120, a latch 130, and a second tensioning member 140. Sliding member 110 fits and is slidable within channel 115. Channel 115 has a wide portion 116, which is typically located somewhere between the ends of channel 115. The tensioning assembly of the present invention is typically incorporated between the outer guide plates of a three-layered chain saw bar. With respect to such chain saw bars, at least a portion of channel 115 will typically coincide with opening 105 in each of the outer guide plates. A more detailed discussion of laminated chain saw bars can be found in U.S. Patent Application No. 6,049,986 titled "Chain Saw Guide Bar Equipped with Chain Tensioner," which is hereby incorporated by reference in its entirety.

[0007] Sliding member 110 has approximately the same width as channel 115 along the length of channel 115 except along the length of wide portion 116 of channel 115. This configuration allows sliding member 110 to be slid along channel 115 in either direction. Adjacent to sliding member 110 in channel 115 is a first tensioning member 120. It is contemplated that a sliding member is "adjacent" to a tensioning member if they are separate but next to one another or if they are integral, attached, or otherwise connected to one another. First tensioning member is depicted in the accompanying figures as a spring. However, different types of springs or any suitable structure capable of biasing the sliding member in one direction could be used. For example, an elastomer or some other material that has properties of tension could be incorporated in or connected to the material. Any

such structure can be considered a means for biasing the sliding member, otherwise referred to as a first biasing means. A tensioning member, such as tensioning member 120 in FIGS. 1-2 or tensioning member 120' in FIG. 3, any other type of spring capable of performing the same function, and structures that have elastomers or other tension-imparting capabilities are all examples of means for biasing the sliding member or first biasing means.

[0008] From the view of the accompanying figures, first tensioning member 120 biases sliding member towards the left. FIG. 1 shows the sliding member pushed towards the left. With respect to the sliding member, this direction will typically correspond with the position of the mounting studs used to mount the chain saw bar on a chain saw. The mounting studs are typically mounted at and extend through opening 105. Because in the configuration shown in FIG. 1 first tensioning member 120 biases sliding member towards the mounting stud, in this configuration there will be a load on the mounting stud which serves to tension the chain and keep it tight. The embodiment depicted in FIGS. 1 and 2 has projections 112 that extend beyond the width of channel 115 such that they remain in the region of wider portion 116 and keep sliding member 110 within a given range of motion with respect to the rest of the chain saw bar. In should be understood, however, that projections 112 are optional and it is contemplated that some embodiments of the invention will have only a single projection, while others will not have any projections at all.

[0009] One or more recesses are formed in the sliding member 110. In the embodiment shown in FIG. 1, recess 114 is formed in a rectangular shape corresponding with the shape of latch 130. Latch 130 is adjacent to second tensioning member 140. Again, this means latch 130 can be separate from but next to second tensioning member 140 or it can be attached, connected, or integral with

second tensioning member 140. Like first tensioning member 120, second tensioning member 140 is depicted in the accompanying figures as a spring. However, again, different types of springs or any suitable structure capable of biasing the latch could be used. An elastomer or some other material that has properties of tension could be incorporated in or connected to the material. Any such structure can be considered a means for biasing the latch, otherwise referred to as a second biasing means. A tensioning member, such as tensioning member 140 in FIGS. 1-2 or tensioning member 140' in FIG. 3, any other type of spring capable of performing the same function, and structures that have elastomers or other tension-imparting capabilities are all examples of means for biasing the latch or second biasing means.

[0010] Second tensioning member 140 biases latch 130 generally in the direction of sliding member 110. When it is desired that the chain be replaced, removed, readjusted, or otherwise loosened, sliding member 110 is forced against the direction in which first tensioning member 120 biases sliding member 110. Once sliding member 110 has been forced to the point at which recess 114 is adjacent to latch 130, second tensioning member 140 will naturally force latch 130 into recess 114, thereby locking sliding member 110 into place, as shown in FIG. 2.

[0011] In this position, there will be no load on the mounting stud via sliding member 110. In other words, the device will typically be in this configuration when it is desired that the chain be replaced, removed, readjusted, or otherwise loosened. When it is desired that the chain be tensioned once again, latch 130 is forced out of recess 114 and away from sliding member 110. An opening may be formed in one of the outer guide plates to allow access to latch 130 in order to apply the necessary force to accomplish this. In addition, the latch may optionally have a slot,

indentation, or other means to allow an instrument to be inserted into or against the latch to apply this force. In the embodiment depicted in FIGS. 1-2, a slot 132 is formed in latch 130 for this purpose. Once the latch has been forced away from the sliding member (against the direction in which it is biased by the second tensioning member), the first tensioning member will naturally force the sliding member back towards the mounting stud (to the left in the accompanying figures).

[0012] In the embodiment depicted in FIG. 3, chain saw bar 100' again has a sliding member 110' fitted within channel 115' and adjacent to first tensioning member 120'. In this embodiment, sliding member 110' has a series of recesses 114' formed into the shape of stairs or teeth. Latch 130' is mounted to one or both of the outer guide plates and is configured to rotate at axis 132'. Latch 130' is biased towards sliding member 110' by way of second tensioning member 140'. When sliding member 110' is forced away from the mounting stud (to the right in the accompanying figures) latch 130' falls into recesses 114' sequentially and ratchets sliding member 110' away from the mounting stud in a step-like fashion. As seen in FIG. 3, recesses 114' are shaped into a series of steps or teeth that allow the sliding member to slide and move along the latch in one direction only. Thus, in this embodiment sliding member 110' can be locked into place with respect to the chain saw bar at any of several positions dictated by the number and spacing of recesses 114'.

[0013] In order to unlock latch 130' from recesses 114' of sliding member 110', an opening may be formed in the outer guide plate near latch 130'. This opening will typically be formed in such a manner that a tool, for example a flat-head screwdriver, may be inserted therethrough in order to force latch 130' away from sliding member 110' and allow second tensioning member 120' to slide sliding member 110' towards

the mounting stud. The depicted embodiment has a slot 136' that extends through at least one of the outer guide plates for this purpose.

[0014] It will be obvious to those having skill in the art that many changes may be made to the details of the above-described embodiments of this invention without departing from the underlying principles thereof. The scope of the present invention should, therefore, be determined only by the following claims.